WHAT IS CLAIMED IS:

1. A method of decoding a signal vector, the method comprising the steps of:

receiving a signal vector $\mathbf{y}_k$;

multiplying the received signal vector $\mathbf{y}_k$ by a conjugate transpose of a channel matrix $\mathbf{H}^*$ and generating a column vector $\mathbf{z}_k$ therefrom;

reordering entries associated with the column vector $\mathbf{z}_k$ and generating an estimated channel matrix $\widetilde{\mathbf{H}}$ therefrom;

decomposing the estimated channel matrix $\widetilde{\mathbf{H}}$ via Cholesky decomposition and generating a triangular matrix $\mathbf{L}$ therefrom;

solving triangular matrix $\mathbf{L}$ backwards and estimating a signal vector $\widetilde{\mathbf{s}}_k$ therefrom, wherein $\widetilde{\mathbf{s}}_k$ is the true sorted symbol vector; and

sorting signal vector $\widetilde{\mathbf{s}}_k$ and generating an estimate of the transmitted symbol vector $\hat{\mathbf{s}}_k$ therefrom.

2. The method according to claim 1, wherein the received signal vector $\mathbf{y}_k$ is represented by the relationship $\mathbf{y}_k = \mathbf{H}\mathbf{s}_k + \mathbf{v}$ and the column vector $\mathbf{z}_k$ is represented by the relationship $\mathbf{z}_k = \mathbf{H}^*\mathbf{H}\mathbf{s}_k + \mathbf{H}^*\mathbf{v}$, wherein $\mathbf{H}$ is a matrix of complex numbers, $\mathbf{s}_k$ is a multidimensional symbol vector transmitted at time k, $\mathbf{v}$ is a multidimensional vector of additive noise+interference, and $\mathbf{H}\mathbf{s}_k$ is the matrix product of $\mathbf{H}$ and $\mathbf{s}$.

3. The method according to claim 2 wherein the multidimensional vector of additive noise+interference $\mathbf{v}$, is represented by the relationship $\mathbf{L}^{*-1}\left(\widetilde{\mathbf{H}}^*\mathbf{v} - \sigma^2\mathbf{I}_{M_t}\widetilde{\mathbf{s}}_k\right)$, and further wherein $\mathbf{v}$ has a zero mean value with a covariance matrix defined as $\sigma^2\mathbf{I}_{M_t}$ under the assumption that associated communication system transmitters transmit each point in the associated communication system constellation with equal probability.